

5.0 Cumulative Impacts

The Council on Environmental Quality (CEQ) NEPA regulations 1508.7 states, ‘Cumulative impact is the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time.’”

Cumulative impacts for each topic of analysis are discussed as part of Section 4. This represents an overall summary of the project and its cumulative impacts to park resources in the Drakes Bay and Estero area.

5.1 Current and Ongoing Actions

Within the project watersheds Laguna, Muddy Hollow, and Glenbrook, impacts associated with farming, dairy, or livestock operation occurred between the 1870s and 1950s. As the history of the Limantour area showed, these areas were divided for development and the infrastructure installed to support the planned community. As Point Reyes National Seashore was established, the final installation of Muddy Hollow Pond and the Glenbrook Crossing were completed and purchased as improvements by the NPS. For the most part, these watersheds have been managed as natural environment and Environmental Protection – Wilderness since the early 1980s. While a number of other man-made structures impeding natural hydrologic process failed in the 1980s, these structures persisted, but are now in need of repair or replacement. The watersheds and associated habitat has developed around these structures and is considered stable. Maintenance is required or this perceived stability is threatened. Other projects proposed within the watersheds include the Coastal Watershed Restoration – Drakes Estero Road Crossing Improvement Project would include culvert improvements at two sites within the Laguna drainage. The other sites included in that project are in the Home Ranch and East Schooner Creek watersheds. The Glenbrook Dam Removal and Quarry Restoration is planned for the failed dam structure in the estuarine portion of Glenbrook Creek. These are described briefly in Table 4-1.

Within the Drakes Estero watershed, there is ongoing dairy and beef cattle grazing, as well as some additional physical habitat restoration projects, namely Horseshoe Pond restoration to coastal lagoon.

Other activities within the Drakes Estero and Drakes Bay watershed include replacement of the waste transfer system at the Ken Patrick Visitors Center (2004), and Stabilization of the Historic Lifeboat Station Marine Railway (2005). Both of these projects are categorically excluded and would not result in impacts that influence the proposed restoration project.

5.2 Past Restoration and Monitoring Activities

Previous monitoring efforts have included post-fire watershed response monitoring within the Muddy Hollow and Glenbrook Creek watersheds (Collins and Ketcham 2001) as well as aquatic surveys for fish habitat (Cappellini and Everly 1997), California freshwater shrimp (Fong and Lo Bianco 2003), the California red-legged frog (Guscio and Fellers 2002), site botanical surveys (Parsons and Allen 2003b) and wetland assessments (Parsons 2003a; Parsons 2003b; Parsons and Allen 2003a). Extensive surveys were conducted as part of the pre-design process for the project and are summarized in the Final Feasibility Report by NHC (2004).

In association with the proposed project, adaptive management and monitoring would be conducted where geomorphic adjustment is likely to result in continued changes to the channel and habitat conditions. These monitoring efforts are intended to provide park management with information to initiate follow-up treatments that could be conducted using previously contracted hand crews.

5.3 Cumulative Impacts

This cumulative impacts section summarizes the potentially compounded impacts of implementation at all project sites by alternative. Because each of these projects (Table 4-1) is identified, individually, as a restoration of natural ecological and physical process, this section is important to ensure that cumulatively, the ecological resources can adjust to the changes in process brought about by these federal actions. It should be noted that the preferred alternative is the treatment proposed under Alternative 1 for Limantour Beach Pond and Muddy Hollow Pond, and under Alternative 2 for Glenbrook Crossing.

Alternative 1 – Full-Build (preferred alternative at Limantour Beach Marsh and Muddy Hollow)

Under Alternative 1, full-scale deconstruction activities would occur at the three project locations with trail reroute occurring in conjunction with the Muddy Hollow and Glenbrook projects). Conversion of pond to estuarine habitat at Muddy Hollow and Limantour Beach Pond sites, as well as removal of a non-conforming road crossing and culvert facility from the Philip Burton Wilderness at Glenbrook Crossing would result in minor to moderate short-term impacts at the project locations. The project activities would alter water resources and biological habitat effecting special status amphibians and fish. The proposed restoration actions represent deconstruction, and are planned to limit or reduce impacts associated with this conversion, and promote recovery in the short-term.

In conjunction with other planned projects within the Drakes Estero and Drakes Bay watershed, this alternative would result in minor short-term impacts associated with the number and timing of restoration activities within the area. In conjunction with the Coastal Watershed Restoration – Drakes Estero Road Crossing Improvements Project and Glenbrook Dam and Quarry Restoration would involve deconstruction/construction activities at each of the work areas. Most similar to

actions described under this project is the Glenbrook Dam and Quarry Restoration, which involves the removal of approximately 19,000 cubic yards of fill from the Glenbrook portion of Estero de Limantour. The materials would be placed in the adjacent spillway and quarry areas allowing for more natural features within this portion of the Wilderness area. If implemented in summer 2005, as planned, this would contribute to the cumulative Wilderness impacts, but by completing this restoration in the same year, would not extend impacts to multiple years.

In general, the projects described are distributed within smaller watersheds draining to Drakes Estero, and would result in long-term hydrologic connectivity, allowing for natural processes to facilitate sustainable habitat features.

Alternative 2 – Partial Build (preferred alternative at Glenbrook Crossing)

Under Alternative 2, deconstruction activities would occur at the three project locations. While the approaches are different for some of the sites, the cumulative impacts analysis would result in the same conclusions because the end products, including conversion of pond to estuarine habitat at Muddy Hollow and Limantour Beach Pond sites, as well as removal of a non-conforming road crossing and culvert facility from the Philip Burton Wilderness at Glenbrook Crossing would be the same. As with Alternative 1, Alternative 2 would result in minor to moderate short-term impacts at the project locations. The project activities would alter water resources and biological habitat affecting special status amphibians and fish. The proposed restoration actions represent deconstruction, and are planned to limit or reduce impacts associated with this conversion, and promote recovery in the short-term.

Cumulatively, the effects of either action alternative would result in similar cumulative impacts interactions with other projects proposed in the area. The actions proposed under Alternative 2 for Muddy Hollow would extend impacts across construction years, while at Glenbrook Crossing, the proposed actions are more limited than that proposed under Alternative 1, and are considered more compatible with Wilderness goals. If conducted in conjunction with the Glenbrook Dam and Quarry Restoration, this would contribute to the cumulative Wilderness impacts, but by completing this restoration in the same year, would not extend impacts to multiple years. In general, the projects described are distributed within smaller watersheds draining to Drakes Estero, and would result in long-term hydrologic connectivity, allowing for natural processes to facilitate sustainable habitat features.

Alternative 3 – No Action

Under Alternative 3, no direct actions would be taken on any of the three project sites, and the project would not contribute to short-term cumulative impacts. Any maintenance activities required in the short term would result in negligible resource impacts. In the long-term, the potential of these structures to fail as a result of flood or geohazard would contribute to moderate cumulative long-term impacts to resources within the Drakes Estero and Drakes Bay analysis areas.

The potential for failure would remain even with regular maintenance. These impacts would be unplanned, and therefore unmitigated. In addition, potential impacts discussed as part of the action alternatives, related to the loss of habitat by California red-legged frog, wetlands and recreational uses would be realized in the long-term at some of these sites.

5.4 Short-term uses versus long-term productivity

The preferred alternative would restore natural hydrologic and shoreline process, consistent with NPS management policies (NPS 2000). The historic shoreline process supported naturally functioning estuarine (at Muddy Hollow and Limantour Beach Pond) and fluvial riparian (Glenbrook Crossing) habitat. These features impede natural hydrologic and ecological process, creating sharp gradients, inconsistent with the types of habitat and conditions that evolved in the area prior to the establishment of ranching operations and subsequent development over the last century and a half.

The proposed restoration of natural processes to these areas would result in changes to more sustainable habitat, and would require replacement or relocation of some visitor amenities including trail access. The long-term sustainability and ecological productivity of these restored areas would become a new recreational attraction and visitor use of the area.

As discussed under no action, the potential for failure of these sites, even with maintenance, remains a possibility given the potential for seismic or flood-flow events. The proposed actions would result in short-term impacts to the resources as a result of direct activities, however the long-term impacts to wetlands, California red-legged frog critical habitat, wildlife viewing, trail access, etc. would all result in the case of failure. Restoration to naturally functioning sustainable systems would support long-term ecological productivity and stability at these sites, beginning with recovery following these treatments.